

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please cancel claims 1-20 and 38-51.

Listing of Claims:

1-20. (Cancelled)

21. (Original) A method for making a semiconductor structure, comprising:
forming a silicon-germanium alloy layer;
forming an undoped silicon layer that overlies the silicon-germanium alloy layer;
seeding the undoped silicon layer to cluster atoms and thereby form nuclei on a surface of the undoped silicon layer; and
annealing the semiconductor structure to grow the nuclei into hemispherical protrusions.

22. (Original) The method of claim 21, wherein forming a silicon-germanium alloy layer includes flowing silane gas, phosphate gas, and germanium source gas at a temperature greater than about 500 degrees Celsius.

23. (Original) The method of claim 21, wherein forming an undoped silicon layer includes flowing silane gas at a temperature greater than about 300 degrees Celsius and less than about 550 degrees Celsius.

24. (Original) The method of claim 21, wherein seeding includes flowing silane gas at a temperature greater than about 550 degrees Celsius and less than about 600 degrees Celsius, wherein a flow rate of silane gas includes greater than about 10 standard cubic centimeters per minute and less than about 30 standard cubic centimeters per minute.

25. (Original) The method of claim 21, wherein annealing includes annealing at a temperature greater than about 550 degrees Celsius and less than about 600 degrees Celsius.

26. (Original) The method of claim 21, further comprising planarizing the semiconductor structure using a chemical mechanical planarization technique.

27. (Original) The method of claim 26, further comprising etching using an etch back technique to remove a portion of borophosphorus silicate glass that surrounds the container.

28. (Original) A method for making a semiconductor structure, comprising:
forming a container in a layer of borophosphorus silicate glass (BPSG);
forming a silicon-germanium alloy layer on a surface of the container and on a surface of the BPSG layer;
forming an undoped silicon layer that overlies the silicon-germanium alloy layer;
removing the portions of the silicon-germanium alloy and undoped silicon layer that are lying on a surface of the BPSG layer;
removing a portion of the BPSG to expose an outer surface of the silicon-germanium alloy layer; and
forming hemispherical protrusions on a surface of the undoped silicone layer.

29. (Original) The method of claim 28, wherein removing the portions of the silicon-germanium alloy and undoped silicon layer includes chemical-mechanical planarizing.

30. (Original) The method of claim 29, wherein forming hemispherical protrusions includes annealing the semiconductor structure to grow the nuclei into hemispherical protrusions.

31. (Original) The method of claim 30, wherein annealing includes annealing at a temperature greater than about 600 degrees Celsius and less than about 650 degrees Celsius for about 5 minutes.

32. (Original) The method of claim 31, wherein seeding includes flowing silane gas at a rate of about 15 standard cubic centimeters per minute.

33. (Original) A method for making a semiconductor structure, comprising:
forming a container in a layer of borophosphorus silicate glass (BPSG);
forming a silicon-germanium alloy layer on a surface of the container, the silicon-germanium alloy having an outer surface abutting the BPSG layer and having an inner surface;
removing portions of the silicon-germanium alloy overlying a surface of the BPSG layer;
removing portions of the BPSG layer to expose at least a portion of the outer surface of the silicon-germanium layer;
depositing an undoped silicon layer over the inner surface and exposed outer surface of the silicon-germanium alloy layer; and
converting the undoped silicon layer into hemispherical protrusions.

34. (Original) The method of claim 33, wherein converting includes seeding the undoped silicon layer to cluster atoms to form nuclei.

35. (Original) The method of claim 34, wherein converting includes annealing the semiconductor structure to grow the nuclei into hemispherical protrusions.

36. (Original) The method of claim 34, further comprising depositing a dielectric layer over the hemispherical protrusions, and wherein the dielectric layer conforms to the hemispherical protrusions.

37. (Original) The method of claim 36, further comprising depositing a conductive layer over the dielectric layer, and wherein the silicon-germanium alloy, the dielectric layer and the conductive layer define a capacitor structure.

38-51. (Cancelled)